Claims

[c1] 1) An apparatus for measuring the axial length of the eye comprising an ultrasound measuring device (probe and piezoelectric device for generating ultrasound for interrogating the dimensions of the eye and a computer for processing these measurements described in previous art), means for directing the focused ultrasound waves of this ultrasound measuring device along the visual axis into the eye, means for stabilizing the ultrasound measuring device in relation to the patient, means for mounting a laser and the ultrasound probe on a carrying platform, means for projecting a laser spot onto a grid, means to assure the projected laser spot is coincident with the interrogating axis of said ultrasound measuring device, means for assuring the correct horizontal and vertical alignment of said ultrasound probe with relation to the gravitational field of the earth, means for assuring correct pressure applied to the ultrasound probe as it contacts the eye, and means for assuring the measurement of the correct axial plane of said eye.

[c2] 2) The apparatus of claim 1 further comprising a standard headpiece to which attaches a platform which stabilizes the ultrasound measuring device with respect to the patient's head and eye.

[c3] 3) The apparatus of claim 1 further comprising a laser projection

device for alignment of the eye during the measurement procedure.

[c4] 4) The apparatus of claim 2 further comprising 6 independently moveable joints designed to bring the ultrasound measuring device into direct contact with the eye and maintain this stationary relationship without additional manual assistance.

[c5] 5) The apparatus of claim 2 further comprising a gravity dependent swing arm that applies the correct, constant and adjustable force to the eye throughout the ultrasound measuring process.

[c6] 6) The apparatus of claim 5 further comprising a bubble level for assuring proper and constant pressure on the ultrasound tip during measurement.

[c7] 7) The apparatus of claim 2 further comprising a carrying platform attached to a swing arm that carries the ultrasound probe, a laser projection device that is coincident with the laser and a second bubble level for assuring proper horizontal and vertical alignment of the ultrasound probe during measurement.

[c8] 8) The apparatus of claim 7 further comprising a laser projection device that is projected onto a grid approximately 10 feet from the apparatus which is used as a fixation target and further used to adjust the amount of force applied to the ultrasound tip as described in claim 5.

[c9] 9) The process of measuring the axial length of the eye with the ultrasound device including the steps of:

[c10] (a) Administering anesthetic drops;

(b) Properly fitting the headpiece on the patient;

(c) Properly aligning the ultrasound probe tip over the eye to be measured;

(d) Modifying the position of the swing arm to assure proper pressure is applied to the ultrasound probe tip during measurement;

(e) Modifying the position of the carrying platform to assure proper horizontal and vertical alignment of the beam from the ultrasound probe tip during measurement;

(f) Confirming by direct observation of the contact point between the ultrasound probe and the cornea that the correct pressure is being applied to the cornea during measurement; and

(g) Measuring the axial length of said eye with ultrasound upon contact with the eye.